

the facial pits in these two genera are homologous structures, despite their difference in position. The pit of *Onohippidium* is larger even than that of *Hipparion* and lies higher on the face, in correlation with the extremely elevated fronto-nasal region of the skull. But in both the casts of the skull of the former genus that I have seen there may be noticed, a little below and in front of the orbit, an additional, quite shallow depression, forcibly recalling, both in position and development, the preorbital muscular depression that exists in some skulls of recent Equidæ.

This pit is well developed in the skull of the quagga in the British Museum, and is also shown, as Dr. Forsyth Major has pointed out, in the drawing of a quagga's skull published by de Blainville. From these two data Mr. Lydekker felt justified in concluding that it is a constant characteristic of quaggas' skulls; and, believing in its absence from the skulls of Burchell's Zebras, he went a step further and used the character as a basis for separating specifically the Quaggas from the Burchell Zebras. This latter opinion was easily refuted by the demonstration of the presence of the pit in a skull of a specimen of Grant's race of Burchell's Zebra: and I am now in a position to state that the conclusion as to the constancy of the occurrence of the pit in quaggas' skulls was also too hastily established; for in the Museum of the Royal College of Surgeons there are skulls of two stallion quaggas, and in neither of them is a trace of the depression perceptible*.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

January 4th, 1905.—J. E. Marr, Sc.D., F.R.S.,
President, in the Chair.

The following communication was read:—

‘The Marine Beds in the Coal-Measures of North Staffordshire.’ By John T. Stobbs, Esq., F.G.S. With Notes on their Palæontology by Wheelton Hind, M.D., B.S., F.R.C.S., F.G.S.

Owing to the disposition of the rocks and other causes, the stratigraphical position of the marine beds can be located with exactness *in situ*, and a large quantity of material can be obtained for examination. The horizons can be utilized for the identification of coal-seams and for the subdivision of the Coal-Measures, as they are remarkably persistent, and can be frequently traced not only

* I am indebted to Mr. R. H. Burne for the opportunity of examining these two skulls and also casts of the skulls of *Hipparion* and *Onohippidium*.

over the North Staffordshire field but in adjacent coalfields. The known horizons at which marine fossils have been obtained are the following, given in descending order:—

11. The roof of the Bay or Lady Coal.
10. The Priorsfield Ironstone-Measures.
9. The Speedwell and Nettlebank Bed. } Below the Twist or
8. The Florence Colliery-Band. } Gin-Mine Coal.
7. Above the Moss Coal.
6. The roof of the Moss Cannel or Single 2-foot Coal.
5. Above the 7-foot Banbury Coal.
4. Beneath the 4-foot Coal of Cheadle.
3. The Knyppersley Band.
2. Near the Crabtree Coal (three horizons).

And also 1. The Weston-Sprink Bed.

A map of the distribution of these beds is given, each one is described in detail, and a list of fossils found from the various exposures is tabulated. The Speedwell and Nettlebank Bed appears to be the most important marine bed in the coalfield; it is remarkably rich in species and individuals, and occurs in the upper portion of the true Coal-Measures. Further, it proves the identity of the Twist coal of the Norton area with the Gin Mine of Longton. Lithologically, the marine beds are undistinguishable from the beds with which they are interstratified; but the fossils are usually in a good state of preservation and not confined to one particular bedding-plane; the individuals are likewise numerous. The marine mollusca are, however, sharply separated from the freshwater forms, and no intermingling occurs. It is remarkable that several of the marine shales immediately succeed the coal-seams. A detailed table of the beds in North Staffordshire is given, to show the exact position of the marine beds; and then several of the seams are traced into the Yorkshire, Lancashire, South Staffordshire, and Coalbrookdale fields. This tracing confirms the conclusion that the Hard Bed of Yorkshire is to be correlated with the Bullion coal of Lancashire and the Crabtree coal of North Staffordshire. Again, 'Green's marine bed' at Ashton-under-Lyme coincides with the Gin-Mine horizon of North Staffordshire; and this, again, with the Pennystone of South Staffordshire and Shropshire. Further, the marine beds indicate the approximate identity of the Silkstone, Arley-Mine, and Cockshead seams. A bibliography is appended.

Dr. Hind, in his Notes on the Palæontology, remarks that from the base of the Pendleside Series to the top of the Coal-Measures there is an unbroken succession of beds—at one time marine, at another estuarine, without unconformity. The two faunas—one with *Carbonicola*, *Anthracomya*, and *Naiadites*, the other with *Pterinopecten papyraceus* and cephalopoda—occur in irregular alternations, the two faunas never mingling. The Author proceeds to give notes on the occurrence of many of the species, and descriptions of some of them, including examples not hitherto known from Britain and one new to science. A table indicating the distribution of the species throughout the chief English Coal-fields concludes the paper.